## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

## (19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 22 April 2004 (22.04.2004)

**PCT** 

(10) International Publication Number WO 2004/033505 A1

(51) International Patent Classification<sup>7</sup>: 2/34, 2/00, B01J 8/18, 8/24, 8/26, 19/24

C08F 10/00,

(21) International Application Number:

PCT/EP2003/010717

(22) International Filing Date:

25 September 2003 (25.09.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

02079251.1

9 October 2002 (09.10.2002) EP

60/418,836

15 October 2002 (15.10.2002) US

(71) Applicant (for all designated States except US): BASELL POLIOLEFINE ITALIA S.P.A. [IT/IT]; Via Pergolesi 25, I-20124 Milano (IT). (72) Inventors; and

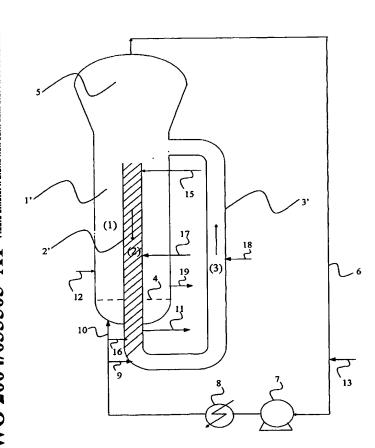
(75) Inventors/Applicants (for US only): COVEZZI, Massimo [IT/IT]; Via Renata di Francia, 40, I-44100 Ferrara (IT). MEIER, Gerben [DE/DE]; Schumannstrasse 54, 60325 Frankfurt (DE). MEI, Gabriele [IT/IT]; Via Beata Lucia da Narni, 3, I-44100 Ferrara (IT).

(74) Agent: COLUCCI, Giuseppe; Basell Poliolefine Italia S.P.A, Intellectual Property, P.le G. Donegani 12, 44100 Ferrara (IT).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: POLYMERIZATION PROCESS



(57) Abstract: Process for the gas-phase catalytic polymerization of olefins carried out in a plurality of interconnected polymerization zones, the process comprising feeding one or more monomers to said polymerization zones in the presence of a catalyst under reaction conditions and collecting the polymer product from said polymerization zones, in which process the polymer particles grow within a first polymerization zone where a fluidized bed is formed, at least a part of said polymer particles leave said first polymerization zone to enter a second polymerization zone through which they flow downward, leave said second polymerization zone and enter a third polymerization zone through which they flow upward under fast fluidization or transport conditions, leave said third polymerization zone and are reintroduced into the first polymerization zone, thus establishing a circulation of polymer between the different polymerization zones.

